

REMARKS

In the Office Action, the Examiner withdrew claims 39 – 44 and 49 – 56 as directed to a non-elected species, refused to cite the Baliga reference, approved the drawing correction, rejected claim 31 as anticipated by Shinohe et al., rejected claims 16, 20 – 23, 25 – 20 (sic, should be 25 - 30), 32, 34 –38 and 46 – 48 as obvious over Shinohe et al in view of Hshieh et al., rejected claim 24 as obvious over Shinohe and Hshieh in view of Hsu et al., rejected claim 33 as obvious over Shinohe and Hshieh in view of Omura et al. and rejected claim 45 as obvious over Shinohe and Omura.

Withdrawn Claims

The claims directed to the non-elected species were marked as (Withdrawn) in the previous response. The withdrawn claim are now cancelled without prejudice.

Refusal to Cite

The response filed by Applicants on October 7, 2003, entitled Amendment “E” After Final enclosed a copy of portions of a textbook “Modern Power Devices” by B. Jayant Baliga, 1987, John Wiley & Sons, Inc., pages 92 - 101, as an Appendix 1. The copied portions were provided to assist the Examiner in understanding the functions of floating guard rings, particularly those of the type shown in the Shinohe reference. The copied pages are not intended to be cited as relevant prior art in the present application but as an aid to understanding the cited prior art. The Baliga text is not of any particular relevance, since the present application relates to an edge termination, and not to a floating guard ring as in Shinohe and the Baliga textbook.

If the Examiner finds the Baliga textbook portions to be relevant to the present application, the Examiner is requested to please so indicate so that an appropriate prior art citation form can be prepared and submitted.

35 USC 102(b)

Applicants respectfully assert that the Examiner is misinterpreting the Shinohe reference, and in particular Figure 14 thereof. The Examiner is respectfully requested to consider the claims 16, 31 and 32 of the present application in view of the following remarks.

As previously discussed with respect to the disclosure of Shinohe, there is no indication in the prior art that would lead the skilled person to provide an edge structure of the type according to the independent claims of this application. There is also no teaching or suggestion in the reference that such an edge structure would be advantageous in reducing the lateral space requirement of the edge structure. Conventional guard rings are normally fabricated at the same time as the active doped region, as taught by the Baliga textbook, and are therefore of generally the same depth as the doped region. In the Shinohe reference, these rings are shallower than the adjacent components. It is not anticipated nor obvious to provide deeper trench type guard rings which are fabricated in separate process steps.

In the specification of the present application, the floating guard rings are described as deep in the inner zone (first and third paragraphs on page 9). The drawings show the floating guard rings extending far deeper into the substrate and into the inner zone than the high voltage components they surround. The specification states that the guard rings may even extend through the entire inner zone and it is conceivable for the trenches to penetrate from the first surface to the second surface of the substrate (page 9, third paragraph).

The claims 16, 31 and 32 have been amended to provide for deep guard rings. New claims 58 - 62 indicate that the guard rings extend through the entire inner zone or that they penetrate through the substrate. These new claims are thereby supported by the disclosure.

Therefore, the prior art gives the skilled person no reason to provide the edge structure according to the independent claims so that the semiconductor component according to the independent claims is new and non-obvious over the cited art.

The prior art to Shinohe does not disclose this feature and so the claims are not anticipated by the cited prior art reference.

35 USC 103(a)

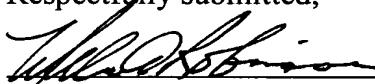
The addition of the Hsieh reference, the Hsu et al. reference or the Omura et al. reference even if considered in combination with Shinohe does not result in a teaching or suggestion of the claimed invention.

The claimed invention is non-obvious over the cited art.

Conclusion

Favorable reconsideration and allowance of the present application is hereby respectfully requested.

Respectfully submitted,


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